The Empirical Study of the Relationship among IT Integration, Decision Making Integration, Organization Relationship Capability and Service Operation Performance

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
AVE	Average Variance Extracted
β	Beta
BPI	Business Process Integration
CFT	Cross Functional Team
COM	Communication
COL	Collaboration
CR	Composite Reliability
CSM	Customer Satisfaction Measure
DV	Dependent Variable
FEM	Financial and Efficiency Measure
H	Hypothesis
IS	Information System
IT	Information Technology
ITI	Information Technology Flexibility and Accessibility
ITM	Information Technology Modularity
ITC	International Trade Center
ITP	Information Technology Planning
MNC	Multinational Company
PLS	Partial Least Square
PLS-SEM	Partial Least Square- Structural Equation Modeling
Q^2	Q Square
R^2	R Square
RP	Risk Perception
SCM	Supply Chain Management
se	Standard Error
SEM	Number of Respondent
SPAN	Normative Susceptibility
SPSS	Statistical Package for the Social Sciences

ABSTRAK (MALAY)

Kajian ini adalah bertujuan untuk menyelidik hubungan antara integrasi IT (*IT flexibility* dan *accessibility, IT planning* dan *IT modularity), decision making integration (cross functional team,* komunikasi, kolaborasi dan *business process integration*), *organization relationship capability* dan *service operational performance* (prestasi dari segi kewangan dan *efficiency* dan prestasi dari segi kepuasan pelanggan) untuk industri elektrikal dan elektronik di *ASEAN*. *Thompson's Interdependence Theory* merupakan dasar rangka kerja model kajian ini. Seramai 83 responden-responden telah mengambil bahagian dalam menjawab soal selidik yang dicipta sendiri untuk tujuan mengumpulkan data. *Partial Least Square (PLS)* dan *Statistical Package for Social Sciences (SPSS)* telah digunakan untuk menganalisis data yang telah dikumpulkan. *IT flexibility* dan *accessibility*, komunikasi dan kolaborasi didapati amat penting dalam menjejaskan *organization relationship capability*, manakala *IT planning, IT modularity, cross functional team* dan *business process integration* tidak membawa kesan kepada *organization relationship capability*. Komunikasi dan *business process integration* amat penting kepada prestasi dari segi kewangan dan *efficiency*. Keseluruhan dimensi menunjukkan kesan yang negatif kepada kepuasan pelanggan. *Organization relationship capability* didapati merupakan pengantara kepada efek komunikasi terhadap kewangan dan *efficiency* kepada syarikat pengedar elektrikal dan elektronik. Hasil kajian ini akan membolehkan syarikat pengedar elektrikal dan electronic di ASEAN untuk memahami dengan lebih teliti hubungan antara *IT integration, decision making integration, organization relationship capability* dan *service operational performance*. Hasil kajian ini kebanyakannya berdasarkan kepada responden-responden di Malaysia, Singapura, Thailand dan Filipina.

ABSTRACT

This study investigates the relationship between IT integration (IT flexibility and accessibility, IT planning and IT modularity), decision making integration (cross functional team, communication, collaboration and business process integration), organization relationship capability and service operational performance (financial and efficiency performance and customer satisfaction *performance*) for electrical and electronic distribution industry in ASEAN. Thompson's Interdependence Theory underlies the model framework in this study. Self-administered questionnaire was the method for data collection with a total of 83 respondents taking part in this study. Partial Least Square (PLS) and Statistical Package for Social Sciences (SPSS) were utilized to analyze the data. IT flexibility and accessibility, communication and collaboration were found to be crucial in influencing organization relationship capability. IT planning, IT modularity, cross functional team and business process integration do not influence organization relationship capability. Communication and business process integration are important to financial and efficiency performance. The entire dimension has a negative influence on customer satisfaction performance. Organization relationship capability was found to mediate the effect of communication on financial and efficiency performance for electrical and electronic distributor company. Finding from this study will enable electrical and electronic distributor company in ASEAN to better understand the relationship between IT integration, decision making integration, organization relationship capability and service operational performance. The findings are mostly based on respondents in Malaysia, Singapore, Thailand and Philippines

CHAPTER 1

INTRODUCTION

1.0 Introduction

The study aims to explore the relationship between Information Technology (IT) integration and Decision Making (DM) integration on service operational performance for Electrical and Electronic (E&E) distribution industries in ASEAN. The study starts by giving the general idea about the research topic and problem of the study as the introduction for this chapter. The background includes the explanation of the concept and the relationship among the IT integration, DM integration, organization relationship capability and service operational performance. Besides, this chapter explains the problem of study and research question and objective. Next, the chapter describes the significance of the study and the key terms of the study is defined at the end of this chapter.

1.1 Background of Study

Over the years, the economy in the ASEAN has grown surprisingly fast and has contributed to the development of the countries in the region. The ongoing dynamic growth of the economy is partly contributed by the E&E industries. Based on the information from ASEANBRIEFING, Singapore's specialized industries include electronic which have made up 27.8% of total manufacturing output in 2013 and manufacturing constitute 21% of Singapore GDP. Manufacturing industry constitute 25%

of GDP in Malaysia and electronic are cover 32.9% in this industry. Thailand's GDP in 2013 remarked manufacturing constitute 33% and electronic are the second highest percentage in this industry.

The E&E industries is very much depended on the distributors in supplying them the electrical & electronics parts in the manufacturing, assembly and test processes. In fact, these E&E distributors play an ultimate important role in the supply chain of the E&E industries. E&E distributors provide service like product, pricing and promotion and customer expected to receive the best price, short lead time, high quality product and after sale services. Therefore, service operational performance has become a critical success factor for E&E distributor industry. Therefore, by improving the service operational performance may help to increase competitive advantage in global market as well as to enhance effectiveness and efficiency of the organizational performance. Based on the data from ASEAN secretariat, June 2015, is showed the major export items in 2014. The electrical equipment, electronic and parts is the most popular export item. The share of total exports is 22.5% out of 100%.

Table 1.1
Major Export Items in ASEAN (2014)

Major Export Items (2014)

	Share of Total Exports
Electrical equipment, electronics and parts	22.5%
Mineral fuels and oils	16.1%
Machinery, mechanical appliances and parts	10.8%
Plastics and parts	3.4%
Vehicles and parts	3.2%
Optical goods	2.6%
Organic chemicals	2.6%
Rubber and articles	2.6%
Others	36.4%

Source: ASEAN Secretariat, June 2015

According to data from the International Trade Center (ITC), ASEAN exported nearly US$300 billion in electronics and electrical equipment on 2014. This makes electrical and electronic the region's largest export sector by substantial margin. It is also the largest export sector for several individual countries including Singapore, Malaysia, Thailand, Philippines, Vietnam and Indonesia. These six countries accounted for almost all of ASEAN electronics export on previous years. Singapore is the region leader for electrical and electronic export and it owes its top position due to its status as a global shipping and business hub. Singapore exported electrical and electronics items to global around 124.8 billion USD in 2014. Malaysia is around 65.7 billion USB, Vietnam is around 44.4 billion USD, Thailand is around 30.7 billion USD, Philippines is around 23.1 billion USD and Indonesia is 9.7 billion USD. E&E distribution plays a very importance role in E&E supply chain system. Therefore, by improving the service operational performance of these firms will be able to increase the growth rate for ASEAN E&E exports and imports.

Table1.2

ASEAN Electronic Export by Country (2014)

ASEAN Electronics Exports by Country (2014)

Country	Value ($bn)	5-year Growth Rate (%)	Global Ranking
Singapore	124.8	5.24	5
Malaysia	65.7	17.84	10
Vietnam	44.4	528.04	12
Thailand	30.7	6.18	14
Philippines	23.1	62.86	20
Indonesia	9.7	6.04	29

Source: International Trade Centre. Trade Map-International Trade Statistics, 2014

One of the ways to improve the service operational performance in this industry is through the adoption of information technology (IT). In fact, the vast potential of IT and the rapidly developing technology have attracted a huge number of business communities. By applying the integration of IT in service operational performance, for instances, for organizations or firms structures which practice the sequential and reciprocal interdependences, decision-making process can be fastened by applying the IT integration among the internal and external practices of the organizations. The application of the IT integration is not only avoid errors from occurring in the service operational performance of an organization, but also prevent the organization from expanding soaring operations costs due to mistakes and uncertainties, at the same time, improving communication and information sharing among the organizations.

The rise of the Internet enables various functions of a supply chain and improves the efficiency in the supply chain management (SCM). Organizations with IT integration, can transfer and share information via the Internet technology or any other IT outsourcing with least time by just one click away.

Many studies reported findings about the relationship between IT and service operational performance. Besides that, research has also shown that "organizations who make decisions jointly and integrate their efforts to produce a product or service adjust more rapidly to changing technologies and market conditions, services in a shorter time period, and provide more creative solutions in the process". Prior studies have supported this argument and have observed significant cost and quality improvements through process and decision-making integration. Most have found that effective process and decision-making integration enables a necessary level of collaboration and coordination

for mutual adjustment that will provide more in depth understanding of the customers' needs, thereby provide customers with higher quality services while simultaneously reducing costs.

The main objective of this study is to have an empirical study on the effects and the value of IT and also to examine the complementarity of IT with decision-making integration, organization relationship capability and operational performance of an organization. The ultimate aim is to investigate the relationships between IT integration and decision-making integration in organization relationship capability and also service operational performance.

As mentioned earlier, IT integration is useful particularly in organization involves dealings with organization in different regions or countries and in situations where acquisition and merger of firms are involved. The same principles and theories apply to decision-making integration. In an effort to improve the operational performance of an organization, decision-making integration plays an important role to increase the organization relationship capability. In a multinational corporation, where goods manufactured or services are rendered in various countries other than its own home country, decision-making integration helps to achieve efficiency and to avoid errors from occurring when the said corporation is to make significant investments in a foreign country. Decision-making integration, in our view, is a strategic management in organizations, especially when there are increasing uncertainties and the dynamics of business environments nowadays.

Decision-making integration usually applies in cross functional teams, when a group of people are working in different functional expertise however with common goal set by the top management of the organization. In cross functional teams, employees are mostly from different areas of expertise and specialties, for instances, finance, accounting, operations, human resources, marketing and legal. Each of them are highly capable, effective and often with their own perspectives. However, this is also the reason why the cross functional teams are always problematic without the decision-making integration. Service operational performance of an organization often requires the input of people from different functional teams. However, combining all the decisions in a cross functional team may be a big challenge to the organization. This is the situation where decision-making integration is important to combine all the voices in single cross functional team, utilize the decisions made by the elite in the organization, which enable the elites from different functional expertise to communicate in order to achieve their common goals in collaboration with each other.

As Internet technology has drastically changed and improved the efficiency and effectiveness of service operational performance, information and decision-making policies can be exchanged and communicated instantly. Organizations have been paying attention on the management of the supply chain management (SCM) systems, which integrates the processes from suppliers to consumers as well as the management of tasks, for examples, manufacturing, sales, logistics, marketing and finance. Hence, business process integration has great significance in planning the strategy in developing and managing the SCM systems. Business process integration helps to set the relations

between tasks and orders so that the organization will achieve its common goals under the given directions.

In this context, it is worth to note that decision making integration is interrelated to the business process integration. By integrating the decisions and opinions from cross functional teams, all the departments in an organization work together with the ultimate aim of achieving the common goals, makes it easier in planning the business process integration.

Organizational capability commonly includes the ability and capacity of an organization, its resources, for instances, human resources, material resources, financial resources, and information resources. IT integration and decision making integration play important roles in improving and increasing the organization relationship capability, in order to achieve competitive gains and also to enable the organization to be outstanding in global marketplace. This is because, IT integration and decision making integration enable pool of information and knowledge, databases as well as to achieve uniformity in the cross functional team of an organization, particularly when acquisition and merger involves.

Firm-level knowledge resources are interrelated to sustain competitive advantage and to increase the ability of an organization to leverage market opportunities (Teece, 1998a; Barney, 1991). According to Jae-Nam Lee, organization capability is very much depending on the ability of an organization to integrate knowledge.

In view of the above, IT integration and decision making integration, if to be applied wisely and fully utilized in the organization management, can increase the

organizational capability. It is therefore important to introduce the IT integration, which provides information and knowledge sharing by just one click away via the World Wide Web, and decision making integration that allows for communication and collaboration as well as efficient and effective decision making among a group of people in different functional expertise of an organization. Against this backdrop, both IT integration and decision making integration will definitely increase the organizational capability and then lead to improve the company's service operational performance.

1.2 Problem Statement

Electrical and electronic distributions play an important role for E&E industries. There are more than 300 electrical and electronic distributor company in ASEAN which include MNC and SME type and this has made electrical and electronic distribution business become more competitive. Although the operational performance area has been widely carried out in various types industries ranging from hospitality (Vedran Capkun et al, 2010), manufacturing (Kohtamaki *et.al*, 2015), government (Celik Parkan, 1999) and electricity distribution (Vinh Sum Chau, 2009), the specific focus of service operational performance for electrical and electronics distribution company is still scarce in ASEAN. Hence, this research target to fill the research gap by focusing the study on service operational performance for electrical and electronics distributions industry.

In order to improve the service operational performance, the electrical and electronics distributors have to find ways to enhance their financial and efficiency performance as well as customer satisfaction performance. At empirical level, many researchers referred to Mohan V.Tatikonda (2001) in their study on the factor which

influences organization relationship capability. The factors that can be influence organization relationship capability can be broadly categorized to two aspects. First is the external integration which link to technological like's product technology novelty and process technology novelty. Second is the internal integration is the organizational process factor such as process concurrency, process formality and process adaptability. Most of the previous researches did not include both external and internal integration in their research. Therefore, this study aims to bridge up the gap on previous research which did not include internal and external integration as the determinants of organization relationship capability.

In previous studies examined more of the direct effects of the internal and external integration on the operational performance and had omitted the possible of intervening effect of the third variable on the direct relationship. There are number of studies had proven the organization relationship capability is related to operational performance (Ravichandran and Lertwongsatien, 2005; Melville *et al.*, 2004). Among of the previous study, it was founded that organization relationship capability is relevant to electrical and electronic distribution industry. Thus, the organization relationship capability will be examined as mediator in the relationship between the IT integration and decision making integration and service operational performance.

In conclusion, the research gap can be filling up by organization relationship capability as a mediator in ascertaining the impact of IT integration and decision making integration towards service operational performance. The measurement of service operational performance will be financial and efficiency measure and customer satisfaction measure.

1.3 Research Objective

This study focus on three objectives below

1. To examine whether IT integration has the positive influence on service operational performance.
2. To examine whether decision making integration has the positive influence on service operational performance.
3. To determine whether IT integration has positive influence on organizational capability
4. To determine whether decision making integration has positive influence on organization relationship capability.
5. To determine whether organization relationship capability has positive influence on service operational performance.
6. To determine whether organization relationship capability mediates the relationship between IT integration and service operational performance.
7. To determine whether organization relationship capability mediates the relationship between decision making, integration and service operational performance.

1.4 Research Questions

Study aim for the answer for below questions to execute the research objective:

1. Does IT integration have the positive influence on service operational performance?

2. Does decision making integration have the positive influence on service operational performance?
3. Does IT integration have positive influence on organization relationship capability?
4. Does decision making integration have positive influence on organization relationship capability?
5. Does the organization relationship capability have positive influence on service operational performance?
6. Does the organization relationship capability mediate the relationship between IT integration and service operational performance?
7. Does the organization relationship capability mediate the relationship between decision making integration and service operational performance?

1.5 Significant of Study

This study is expected to provide significant theoretical and practical evidence in the area of IT integration, decision making integration, organization relationship capability and service operational performance.

According to Thompson (1967), the Thompson's Interdependence Theory proposes that organizations, although natural and open systems, will work to achieve bounded rationality at different levels of interdependence. Coordination mechanisms are defined as a means to link entities of the network to enable communication and common action, while also building a common pool of knowledge. Thompson argues that coordination becomes increasingly important across the three levels of interdependence,

and this coordination is best accomplished through effective knowledge-sharing and communication. He suggests that using an appropriate coordination mechanism will enable and enhance coordination, and he offers mutual adjustment as a valuable mechanism for those networks at reciprocal interdependence. Mutual adjustment allows for the transmission of information during action and is best suited for those networks exhibiting high levels of unpredictability and variability. Further, mutual adjustment allows for joint problem-solving and decision-making.

Coordination among information network is facilitated by the network resources and capabilities. These resources and capabilities can be both tangible and intangible, but should enable integration across all entities of the network. When effectively utilized, the network will be able to integrate both IT and decision making, thereby improving coordination and collaboration across the network.

With reference to the theoretical perspective, this study hopes to provide a depth understanding of IT integration and decision making integration influence of organization relationship capability and service operational performance in electrical and electronic distribution industries within ASEAN country.

From the practical point of view, the finding of this research will assist the electrical and electronics distributor to add value to their financial and efficiency performance as well as customer satisfaction performance to achieving competitive advantage. By integrating IT and decision making process will be able to improve the service operational performance.

1.6 Definition of Key Variables

There are importance key variables in this research which are IT integration, decision making integration, organization relationship capability and operational performance.

1.6.1 Information Technology Integration

The IT integration consist of IT flexibility and accessibility, IT planning, and IT modulation in this research (Thrasher *et al.,* 2010).

1.6.2 Decision Making Integration

DM integration consists of cross functional team, communication, collaboration, and business process integration in this research (Thrasher *et al*., 2010). .

1.6.3 Organization Relationship Capability

Organization relationship is the ability to manage between IT and business groups and it able to improve the firm's business performance (Hyun *et al.,* 2007).

1.6.4 Service Operational Performance

Service Operational performance is the firm's performance measured against standard or prescribed indicators of effectiveness, efficiency, and environment responsibility such as cycle time, productivity, waste reduction, and regulatory compliance. In service industries, the performance measures by financial and efficiency performance and customer satisfaction performance (Aranda, 2003).

1.7 Organization of Remaining Chapters

In general, this research consists of five chapters. First of all, first chapter introduces this research and provides an overview of this study which highlights the background of the study, research problem, research questions, research objective, significance of the study, and definition of the key variable terms. Chapter two discusses the literature of previous studies that are related to relationship of IT integration, decision making integration, organization relationship capability and services operational performance. It also covers the theoretical framework of this study and the development of the hypotheses. The third chapter demonstrates the methods used to conduct this study, which includes the research approach, sample design, sampling method, data collection method, questionnaire design as well as statistical analysis techniques. Chapter four analyzes the results that were obtained by using the SPSS and PLS software. Various analyses such as statistical analysis, descriptive analysis, validation analysis, reliability analysis and structural equation modeling analysis were discussed. Lastly, chapter five discusses the overall findings and implications of this study, the limitation of this study, suggestions for future research and conclusions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter illustrates a detailed literature review related to Electrical and Electronic distribution industries in ASEAN, IT integration, Decision Making integration, Organization Relationship Capability and the Service Operational Performance.

2.2 Definition of E&E Distribution

Distribution is the process to marketing, promoting and selling the goods to the marketplace such that a large number of people can purchase it. An E&E distribution involves doing few things. First, an E&E distributor must have a good transport system to take and deliver the electrical and electronics parts into different geographical areas. Second, an E&E distributor have a good tracking system to make sure the right E&E goods are able to deliver to right place at right time and also in good condition. Third, good packaging system to make sure the goods are always in right quality. Fourth, a track and record system to tracking the places and time where the products can be placed such that maximum business opportunity. Last, provider after sale services like get the feedback from customer and a system to take back the issue goods.

Distribution is critical for E&E industrial and plays an importance role in supply chain system. A good distribution system can let the E&E companies be more competitive in the market. The E&E companies that able to sale their products wider and

faster with lower costs into the market compare with their competitors will make higher margin and last longer in the market condition.

2.3 Service Operational Performance

In service industries, communication and interaction between customers and service firms play a very important role in ensuring satisfactory performance. Service industries require high degree of flexibility as customers' demand are of utmost importance (Adler, 1988). In order to cope with hyper competition, firms need to improve its flexibility and capability as customers have becoming more demanding nowadays (Vandermerwe, 1992). In this context, the flexibility of services can be considered in various aspects, for instances, volume, time and place, needs and customer (Harvey *et al.*, 1997). In service delivery process, high productivity is the main factor to be considered by service firms (Gronroos, 2007).

Service industries are different from manufacturing industries as it can only be conducted or performed upon input or demand by customers and cannot be delivered in advance (Sampson and Froehle, 2006). Due to the fact that delivery of a service is very much dependent on the input or data given by customers, problems occur as sometimes customers do not behave as expected. This is when interruptions occur and severely affect the service operational performance, for instance, time-lags (processing of an activity which has to wait for customer input), loops (a previous activity within the process has to be repeated after receiving customer input). These may cause the distribution of products or delivery of services to be delayed (Leyer and Moormann, 2012).

There is no definition that is generally shared for the term "service" (Prajogo, 2006; Spring and Araujo, 2009). However, there are various ways to characterize services. For instance, it may include the services of marketing, operations, economics, information systems, computer science and industrial engineering (Maglio *et al.*, 2010). As what was mentioned earlier, service delivery is very much dependent on the input or demand given by the customers (Sampson and Froehle, 2006; Correa *et al.,* 2007). Besides these, there are still varieties of services in the literature that have yet to be specifically defined (Spring and Araujo, 2009).

In business service, a service can be defined as delivering a chain set of activities which are required by customers. The duty of the service firm is to transform the input (given by the customers) into output (a set of activities performed by the service firm) (Porter, 1991). A pivotal characteristic of service processes is the integration of customers in the process of delivering the particular service (Zeithaml *et al.*, 1985; Sampson and Froehle, 2006). Customers input are necessary in order to perform the service, especially to provide necessary data or information during the delivery of service (Bowen, 1986). Hence, this is the reason why it is not possible to perform a service without a customer order (Sampson, 2010).

Many services include more than one service type (Leyer and Moormann, 2012). For instance, electrical and electronic distribution requires the input or demand by the customers as to what are the specifications of products required (information); the engineer from the service firm shall look for the products (electrical and electronic) to suit the said requirements (information processing) and provide the said products accordingly (delivery of service).

Service performance is always dependent on the consumers' judgment about the overall service (Gronroos, 2000; Zeithaml. 1988). In short, it is depending on the consumers' level of satisfaction (Oliver, 1999).

2.3.1 Measurement of Service Operational Performance

Performance measurement is very important in management (Pongatichat and Johnston, 2008). Performance measurements indicate how well the communities fit in the operations strategy that has been implemented (Suarez *et al.,* 1996). For service sectors, effective performance measurements require the consideration from manufacturing efficiency to capturing the customer demands (Abernethy and Lillis, 1995). It helps to assess the strengths and weaknesses of the organization, and also helps to set future objectives in improving organizational performance (Purbey *et al.*, 2007).

Service firms had been focusing on financial achievements while assessing the organizational performance in the past. Subsequently, organizations started to realize the importance of non-financial achievement, for instance, service quality (Duggirala *et al.*, 2008; Chau, 2009). Hence, service firms started to assess organizational performance by considering its service quality.

There are various ways in measuring operational performance. It depends on which dimension the said firm or organization prefers to focus on (Venkatraman and Ramanujam, 1986). Performance measurement can be classified into various categories, for instance, internal quality measures, external financial status measures, external quality measures and internal cost measures (Li and Benton, 1996).

Our interest of this study is an aggregate assessment of service operational performance that is relevant to E&E distribution in ASEAN. In general, the service operational performance can be measured from both tangible and intangible measurement (Demirbag *et al.,* 2006). The tangible measurement is the Financial and Efficiency Measures (FEM) and the intangible measurement is the Customer Satisfaction Measures (CSM) (Aranda, 2003). This study adopted the measures from Aranda (2003) which are financial and efficiency and customer satisfaction. This is importance to look into service operational performance aspect and identify areas in which they can improve the distribution industry.

2.4 IT Integration

IT integration is defined as alliance of network that provides smooth and consistent access to up-to-date information and data among the network members (Thrasher *et. al.,* 2010). With the enhancement of alliance network, IT integration plays a very significant role in improving operational performance as well as to gain competitive advantage (Barney, 1991).

According to Kilbridge (1998), IT integration consists of 3 main features: IT flexibility and accessibility, IT modularity and IT planning. IT integration includes hardware and software, planning, and adaptive and flexible solutions to its participants (Thrasher *et. al.,* 2010). IT integration usually helps to improve quality of products (for manufacturing) and services. In financial perspective, IT integration may reduce administrative cost (Bates, 2002). It is the root of the entire alliance network as IT integration may directly contribute to decision-making integration (Thrasher *et. al.,* 2010).

2.4.1IT Flexibility& Accessibility

IT flexibility and accessibility means the adaptability of IT resources to integrate and accessible, up-to-date data sharing throughout the organization (Byrd and Turner, 2000). It is the ability to adapt or support variety of hardware, software, technologies, information, applications, and skills with the existing IT infrastructure (Byrd and Turner, 2000).

2.4.2 IT Planning

IT planning means organizational IT plans and the level of participation and effectiveness of IT steering team or advisory committee (Lewis and Byrd, 2003). IT planning is very important in enhancing the system of an organization. The level of participation of IT and its effectiveness may affect the decision making of cross functional teams in an organization. IT planning is also closely related to IT integration as it determines to what extend the information technology is to be integrated and subsequently to be adapted to the entire organization. According to Nambisan *et al.* (1999), IT steering committee can enhance knowledge sharing as well as transmission of knowledge. According to Gwo-Guang Lee and Rong-Ji Bai (2003), IT planning can connect organization's strategic objectives with its IS portfolio. When different department teams are linked together in knowledge and information sharing and also strategy planning and objectives, consensus can be achieved.

2.4.3 IT Modularity

IT modularity means ease of application in the organization (Byrd and Turner, 2000). It means the ability to add, edit and remove software, hardware or data easily

without any effect. It is also applicable when IT software, hardware and data can be seamlessly diffused into the infrastructure (Byrd and Turner, 2000).

2.4.4 IT Integration and Service Operation Performance

IT integration plays a very importance role in improving operational performance as well as to gain competitive advantage (Barney, 1991). IT integration includes hardware and software, planning, and adaptive and flexible solutions to its participants (Thrasher *et. al.,* 2010). IT integration usually helps to improve quality of products (for manufacturing) and services. Service firms had been focusing on financial achievements while assessing the organizational performance in the past. Subsequently, organizations started to realize the importance of non-financial achievement, for instance, service quality (Duggirala *et al.*, 2008; Chau, 2009). In financial perspective, IT integration may reduce administrative cost (Bates, 2002).

2.4.4.1 IT Flexibility& Accessibility and Financial and Efficiency Performance

According to Weill (1993), IT flexibility must be able to cope with customer demands without increased costs being incurred. Venkatraman (1994), on the other hand, suggested that IT should be focused on the efficiency of its implementation and the extend of its flexibility whereas Allen and Boynton (1991) are of the opinion that efficiency and flexibility are the significant factors in applying IT applications.

2.4.4.2 IT Flexibility& Accessibility and Customer Satisfaction Performance

It is also suggested that IT flexibility enables organizations to take note and adapt to latest market conditions (Byrd and Turner, 2000). When market conditions are taken

into consideration, collaborated information will contribute to increased customer satisfaction.

2.4.4.3 IT Planning and Financial and Efficiency Performance

Since early 1980s, many have begun to utilize or apply IT planning in increasing organizational competitiveness and at the same time also to gain competitive advantages (Gwo-Guang Lee and Rong-Ji Bai, 2003). The impact of doing so, according to Gwo-Guang Lee and Rong-Ji Bai (2003), is to optimize business performance. IT planning is considered as a problem-solving process in order for organization to establish business strategies and also to produce information system required by organization (Huysman *et al.*,1994). When different interested groups interact and communicate via IT planning, uniformity of management can be achieved and thus, managerial capability and efficiency of an organization can be enhanced without having to incur massive costs (Kearns and Lederer, 2000).

2.4.4.4 IT Planning and Customer Satisfaction Performance

In service sector, organization may enhance its IT team or IT department, ensure that the IT facilities are up-to-date; the seamless IT network helps to integrate or accumulate all the knowledge and information sharing between different departments from the organization and also to collect information in order to improve service quality (Gwo-Guang Lee and Rong-Ji Bai, 2003). Hence, IT planning is significant to increase customer satisfaction performance, especially when information regarding customers changing demands and contemporary data are shared among different interested groups in an organization.

2.4.4.5 IT Modularity and Financial and Efficiency Performance

IT modularity provides flexibility and variability, and subsequently helps to enhance performance and efficiency. According to Jose and Tollenaere (2005), modularity enables cost savings, diversification, and the ability to simplify complex systems. The ease of application and data transparency, its flexibility to be applied to cope with different situation in an organization will increase the efficiency and effectiveness of operational performance.

2.4.4.6 IT Modularity and Customer Satisfaction Performance (H2.3b)

With IT modularity, the ease of application of software, hardware and transparency of database enable information sharing to be done across organizations in order to fulfill customer needs, customer satisfaction can be achieved.

2.5 Decision Making Integration

Decision-making integration is defined as alliance of network that consists of combination and efficient decision making among the network members (Thrasher *et. al.*, 2010). Decision-making integration helps to ensure higher level of coordination and subsequently leads to flexibility, collaboration and also enhances or improve products and services (Bhatt, 2000).

Decision-making integration consists of the followings: cross-functional teams, communication, collaboration and business process integration (Nahm *et. al.*, 2003). In service factors, decision-making integration enables mutual understanding among network members and provides in depth understanding of customers' needs, thereby helps to improve performance and at the same time reduce costs (Thrasher *et. al.*, 2010).

2.5.1 Cross Functional Teams

Cross-functional teams mean the integration and coordination of employees from different functions and organizations in order to complete the same tasks (Nahm *et al.,* 2003).

2.5.2 Communication

Effective communication may help to enhance information sharing and also improve the coordination of activities and decision-making across the network among the participants, subsequently; improve the alliance network performance (Papazoglou *et. al.,* 2000).

The measurement of communication can be determined in terms of speed, ease, and abundance of communication, regardless of whether it is within or across the organization (Nahm *et al.,* 2003).

2.5.3 Collaboration

Collaboration, whether it is in the aspect of achieving mutual understanding or collaboration of information, plays a vital role in enhancing organizational performance. For instance, collaboration between supply chain partners (Lusch *et al.*, 2008) helps to ensure the launching or marketing of products are on schedule and goes on as planned. It helps to avoid any delay and losses due to miscommunication or mismanagement.

Collaboration of information, on the other hand, helps organizational relationship to achieve mutual understanding. This is applicable particularly when partners are involved in making decisions which are beneficial to each other as mutual understanding